

इंटरनेट

मानक

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“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 12308-1 (1987): Methods for Chemical Analysis of Cast Iron and Pig Iron, Part 1: Determination of total carbon by thermal conductivity method (for carbon 1.00 to 4.50 percent) [MTD 6: Pig iron and Cast Iron]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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Indian Standard

METHODS FOR
CHEMICAL ANALYSIS OF CAST IRON AND PIG IRONPART 1 DETERMINATION OF TOTAL CARBON BY THERMAL
CONDUCTIVITY METHOD
(FOR CARBON 1.00 TO 4.50 PERCENT)

1. Scope — This standard (Part 1) covers method for determination of total carbon in cast iron and pig iron in the range of 1.00 to 4.50 percent.

2. Sampling

2.1 The sample shall be drawn and prepared as prescribed in the relevant Indian Standard.

2.2 The sample is to be cleaned with analar grade organic solvent (like acetone, benzene or ether) by washing it thrice and dried in an air oven at $100 \pm 5^\circ\text{C}$.

3. Quality of Reagents — Unless specified otherwise, analytical grade reagents shall be employed in the test.

4. Determination of Total Carbon by Thermal Conductivity Method

4.1 Outline of the Method — The sample is burnt in stream of oxygen in presence of metal accelerator. The carbon dioxide formed is selectively adsorbed on the molecular sieve and released by heating at 300°C . The detector is a thermistor cell, which senses the difference between the thermal conductivity of the carrier gas (oxygen) and that of the carrier gas containing carbon dioxide.

4.2 Reagents

4.2.1 Oxygen (O_2) — 99.5 percent pure (minimum).

4.2.2 Ascarite or soda-lime — 0.80 to 2.00 mm.

4.2.3 Magnesium perchlorate — 0.80 to 2.00 mm.

4.2.4 Concentrated sulphuric acid — rd = 1.84 [conforming to IS : 266-1977 'Specification for sulphuric acid (revised) '].

4.2.5 Sulphur trap — Containing activated manganese-dioxide (MnO_2).

4.2.6 Carbon dioxide convertor — Containing copper oxide maintained at 300°C .

4.2.7 Accelerators — Copper, tin or iron granules (free from carbon and sulphur).

4.2.8 Crucibles — Pre-ignited crucibles of precise dimensions which may be accommodated in the combustion tube of induction furnace.

4.3 Apparatus — Any analyzer consisting of induction furnace, molecular sieve, chromatographic column and thermistor type detector.

4.4 Procedure

4.4.1 Standardization

4.4.1.1 Switch on the instrument for 4 hours before analyzing the sample for attaining the thermal stability of the cell.

4.4.1.2 Start the flow of purified oxygen gas and pass it continuously through the system at a rate of 1 000 — 1 500 ml/minute.

4.4.1.3 Transfer into the pre-ignited crucible, 0.5 g standard sample which has a value of carbon in the range of interest and add 0.5 g accelerator.

4.4.1.4 Insert the crucible into the induction furnace, wait for 30 seconds and start the induction.

4.4.1.5 Note the percentage of carbon, adjust, if necessary, the standardization until the certified value of carbon for the standard sample is obtained and with the desired reproducibility.

4.4.2 For sample

4.4.2.1 Transfer 0.5 g of accurately weighed sample into the pre-ignited crucible and add 0.5 g of accelerator.

4.4.2.2 Insert into the induction furnace and proceed until the percentage of carbon is read out.

4.4.3 Reproducibility — ± 0.5 percent.

EXPLANATORY NOTE

Chemical analysis of cast iron and pig iron was covered in IS : 228-1959 'Methods of chemical analysis of pig iron, cast iron and plain carbon and low alloy steels (*revised*)'. During the second revision of this standard, it was decided that a comprehensive series on above standard should be prepared only for chemical analysis of all types of steels and chemical analysis of pig iron and cast iron be covered in a separate standard. Accordingly, IS : 228, in its various parts, was published for the chemical analysis of steels.

This standard (Part 1) is one of the series of Indian Standard on methods for chemical analysis of cast iron and pig iron. The other parts in the series are:

Part 2 Determination of sulphur by iodimetric titration after combustion, and

Part 3 Determination of manganese by periodate spectrophotometric method.